DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
ACQUISITION LOGISTICS AND TECHNOLOGY
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WASHINGTON DC 20310-0103

09 DEC 2003

Dr. Joseph Braddock
Chair, Army Science Board
2511 Jefferson Davis Highway, Suite 11500
Arlington, Virginia 22202

Dear Dr. Braddock:

I request the Army Science Board (ASB) conduct a Directed Energy Study entitled " Implications of Directed Energy Weapons (DEW) and Devices on the Future Battlefield." The study should address, but is not limited to, the Terms of Reference (TOR) described below. The ASB members and consultants appointed to this study should consider the TOR as guidelines and may expand the study to issues considered important to the study. Modifications to the TOR must be addressed with you.

Problem/Background:

Directed Energy Weapons have the potential to revolutionize warfare. They act at the speed of light and can disable or disrupt nearly instantaneously. In the case of High Energy Lasers (HEL), weapons can be very precisely aimed with almost no collateral damage. Another branch of directed energy (DE), High Power Microwave (HPM) systems, can disable or disrupt electronic systems. Effects from DEWs can range from nonlethal crowd control to nearly instantly destroying, lethally damaging or disrupting major land, sea, air and space weapons or support systems. Missions such as close air support or the use of optics for weapon systems could be dramatically diminished with the fielding of HELs. The DE devices can also be used to sense, image, locate and track objects of interest. In simple terms DEWs and related directed energy devices are versatile and can be lethal and precise.

A great benefit of DEWs is that the "bullets" can store electricity which can come from a common battlefield source such as diesel fuel. This offers potential for reducing the logistics burden for deployed forces and the cost of manufacturing rounds. Examples of vulnerabilities are that HELs can be limited by atmospheric and obscurant scattering and absorption, and HPM systems have a substantial probability of disrupting or disabling friendly electronic systems unintentionally.

The DE technologies, specifically solid state high energy lasers, are maturing to the point where they will be ready for fielding during the next decade. Chemical lasers have already demonstrated the end-to-end process of detecting, tracking, and destroying incoming tactical rockets and artillery shells. Some HPM capabilities exist today. The introduction of such devices onto the battlefield will present unique challenges across the DOTMLPF (doctrine, organization, training, materiel, leader development, people, and facilities) and require an across the board assessment to ensure ease of integration into future battlefield operations.

TOR:

a. Review the status of DE technology development, and examine projections for maturing these technologies.

b. Assess plans for integrating DE capabilities into battlefield weapon systems. The assessment should consider all possible DE functions on the battlefield such as Air Defense, Communications, Information Operations, Protection Systems (ground-based and airborne), Countermine, Target Designation, etc.

c. Examine implications of these devices for each of the DOTMLPF for each mission area, and provide an assessment of the impact on conventional warfighting tactics, techniques and procedures. The resulting product should identify specific challenges the Army will face in integrating DE capabilities and should suggest potential approaches for mitigating these challenges.

d. Estimate the potential national security and warfighter payoffs for HEL and HPM weapons, given the investment to develop those weapons.

Study Sponsorship: U.S. Army Space and Missile Defense Command will be the primary sponsor. I recommend you contact U.S. Army Training and Doctrine Command and request they also support your study.

Study Duration: Please initiate the study in October 2003, provide interim progress reports in February and May 2004, and report out during July 2004.

Special Provisions: Conduct the study within the provisions of Public Law 92-463 (Federal Advisory Committee Act) and appropriate Department of Defense and Army Regulations. It is not anticipated that this inquiry will go into any of the "particular matters" within the meaning of Section 208, Title 18 of the United States Code.

Sincerely,

Claude M. Bolton, Jr.
Assistant Secretary of the Army
(Acquisition, Logistics and Technology)